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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,249

09/15/2006

Tetsuo Yazawa

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EXAMINER

BERNS, DANIEL J

ART UNIT

PAPER NUMBER

1736

NOTIFICATION DATE

DELIVERY MODE

12/21/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/593,249	YAZAWA ET AL.	
	Examiner	Art Unit	
	DANIEL BERNS	1736	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1-6 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-6 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Continued Examination under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114 *and* a request for Suspension of Action under 37 CFR 1.103(c), including the fees set forth in 37 CFR 1.17(e) and 1.17(i) were filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fees set forth in 37 CFR 1.17(e) and 1.17(i) have been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's 7/21/11 submission has been entered. The period of suspension ended prior to the preparation of this Office Action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Mikawa et al.'s 1998 article ("Mikawa"). Mikawa discloses HF-treated artificial quartz crystals as claimed. *See* Mikawa at, *e.g.*, p.801; Figs. 1-3. The fact that Mikawa does not specifically term its crystals a "photocatalyst" as claimed cannot by itself distinguish claim 1 from Mikawa. *See Ex parte Stanley*, 121 USPQ 621, 625 (BPAI 1958) (holding that mere nomenclature differences do not patentably distinguish a claim from the prior art).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

Art Unit: 1736

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. In considering the obviousness rejections below, the applicant should note that the person having ordinary skill in the art at the time of the invention has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in the application reasonably reflect this level of skill.

9. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mikawa as applied to claim 1, above, further in view of the following teachings. Regarding claim 1, Mikawa's teachings are as above. Alternatively regarding claim 1, given Mikawa's teachings, it would have been obvious to one of ordinary skill in the art at the time the invention was made to treat Mikawa's artificial quartz particles with HF as claimed in view of Mikawa's specific teaching of doing so- the ordinarily-skilled practitioner is reasonably expected to be able to follow such explicit teachings.

Regarding claims 2-4, Mikawa teaches that synthetic/artificial quartz plates of ~1mm thickness are treated with aq. HF to etch the same.

The difference between claims 2-4 and Mikawa is that the latter does not explicitly teach the pulverization of its quartz into $\leq 3\text{mm}$ or $\leq 2\text{mm}$ diameter particles and employing the same in its aq. HF treatment step. Notwithstanding the foregoing, it nevertheless would have been obvious to one of ordinary skill in the art at the time the invention was made to do so- the ordinarily-skilled practitioner would reasonably have been expected to be able to ascertain and employ appropriate/desired particle diameters in the aq. HF treatment step, especially given Mikawa's teaching of ~1mm thick wafers (i.e. very small dimension already taught).

It is important to note that change in size and shape is not patently distinct over the prior art absent persuasive evidence that the particular configuration of the claimed invention is significant. *See In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). *See also* MPEP 2144.04 IVA-B. Further, arguments of counsel cannot take the place of factually-supported evidence when responding to such an issue. *See, e.g., In re Huang*, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996); MPEP 716.01(c) II; MPEP 2145.

Lastly, the fact that Mikawa does not specifically term its crystals a “photocatalyst” or describe its aq. HF treatment step as an “activating” step as claimed cannot by themselves distinguish claims 2-4 from Mikawa. *Ex parte Stanley*.

10. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mikawa as applied to claim 1, above, in view of Fujii, US 2002/0170815 (published 11/21/02). Regarding claim 5, the difference between said claim and Mikawa is that the latter fails to explicitly teach

Art Unit: 1736

the detoxification of an environmental pollutant by contacting a gas containing said pollutant with its photocatalyst under photo-activation conditions, wherein its photocatalyst is in an oxidizing condition. These limitations, however, are taught by Fujii.

Fujii teaches the oxidative decomposition of gaseous contaminants from a mixed gas (such as air) by contacting the mixed gas with a photocatalyst, which is necessarily in an oxidizing condition, and under photo-activation conditions. *See* Fujii at, *e.g.*, par. 34, 38, 39, 93, 95, 415 and 416; clms. 1 and 7. While Fujii does not explicitly employ quartz photocatalysts such as Mikawa's in its methodology, Fujii nevertheless does not state that its detoxification method is limited to certain photocatalysts. In the absence of such a limiting teaching, and given the known effectiveness of photocatalysts in eliminating such contaminants from mixed gases as taught by Fujii, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a photocatalyst such as Mikawa's in a detoxification context such as Fujii's- doing so would involve a reasonable expectation of success. *See* MPEP 2143 (at least rationales (B) and (E)); *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1395-97 (U.S. 2007)¹.

Regarding claim 6, Fujii teaches the oxidative decomposition of gaseous contaminants such as NO_x, and states that the presence of water in the mixed gas advantageously aids in activating the photocatalyst. *See id.* at par. 34, 36, and 416; clms. 4, 5 and 9.

11. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson's 1979 article. Regarding claim 1, Wilson teaches the etching treatment of artificial quartz crystal particles. *See* Wilson at, *e.g.*, p. 478, 2nd full par.

¹ *See also Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 335, 65 USPQ 297, 301 (1945) ("Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle."); MPEP 2144.07. *See also Pfizer v. Apotex*, 480 F.3d 1348, 82

The difference between claim 1 and Wilson is that the latter fails to explicitly teach that its particles are treated by HF. This limitation, however, is at least suggested by Wilson- Wilson teaches that HF solutions are one of "the most popular solutions due to their ability to etch quartz in a relatively short period of time..." *See id.* at p. 478, 1st full par. While Wilson's discussion of HF solutions was vis-à-vis natural quartz particles, *see id.*, it nevertheless would have been obvious to one of ordinary skill in the art at the time the invention was made to treat Wilson's artificial quartz particles with HF, in view of the rapid etching ability thereof. MPEP 2143 (at least rationales (B), (E), and/or (G)); *KSR v. Teleflex*².

Lastly, the fact that Wilson does not specifically term its crystals a "photocatalyst" as claimed cannot by itself distinguish claim 1 from Wilson. *Ex parte Stanley*.

Regarding claims 2-4, while Wilson does not appear to explicitly teach particle diameters as claimed, Wilson does state its desire for artificial quartz crystals' etch pits to mimic those in natural quartz, which had been "crushed and sieved to sand size." *See Wilson* at p. 478, 2nd full par. Given the well-known scientific principle of isolating/reducing variables (i.e. keeping constant all factors not directly being examined)³, it would have been obvious to one of ordinary skill in the art at the time the invention was made to crush Wilson's artificial quartz particles to sand size (i.e. <2mm diameter) and so treat said crushed particles in an HF solution as claimed, to remove any consideration of different or anomalous results being attributable to quartz particle size differences. It is also noted that changes in size and shape are not patently distinct over the

USPQ2d 1321 (Fed. Cir. 2007) (holding that selecting from a set of 53 anions known to be acceptable for the given purpose would still give rise to a reasonable expectation of success [despite the size of the set]).

² *See* fn. 1, above.

³ Said principle is "capable of such instant and unquestionable demonstration as to defy dispute" and thus qualifies as well-known in the art even absent documentation thereto. *See In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970) (internal citations omitted); MPEP 2144.03.

Art Unit: 1736

prior art absent persuasive evidence that the particular configuration of the claimed invention is significant. *In re Rose*; *In re Rinehart*; *In re Dailey*. See also MPEP 2144.04 IVA-B. Further, arguments of counsel cannot take the place of factually-supported evidence when responding to such an issue. *In re Huang*; MPEP 716.01(c) II; MPEP 2145.

Lastly, the fact that Wilson does not specifically term its crystals a “photocatalyst” or describe an HF solution treatment step as an “activating” step as claimed cannot by themselves distinguish claims 2-4 from Wilson. *Ex parte Stanley*.

12. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson as applied to claim 1, above, in view of Fujii. Regarding claim 5, the difference between said claim and Wilson is that the latter fails to explicitly teach the detoxification of an environmental pollutant by contacting a gas containing said pollutant with its photocatalyst under photo-activation conditions, wherein its photocatalyst is in an oxidizing condition. These limitations, however, are taught by Fujii.

Fujii teaches the oxidative decomposition of gaseous contaminants from a mixed gas (such as air) by contacting the mixed gas with a photocatalyst, which is necessarily in an oxidizing condition, and under photo-activation conditions. See Fujii at, e.g., par. 34, 38, 39, 93, 95, 415 and 416; clms. 1 and 7. While Fujii does not explicitly employ quartz photocatalysts such as Mikawa’s in its methodology, Fujii nevertheless does not state that its detoxification method is limited to certain photocatalysts. In the absence of such a limiting teaching, and given the known effectiveness of photocatalysts in eliminating such contaminants from mixed gases as taught by Fujii, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a photocatalyst such as Wilson’s in a detoxification context such

Art Unit: 1736

as Fujii's- doing so would involve a reasonable expectation of success. *See* MPEP 2143 (at least rationales (B) and (E)); *KSR v. Teleflex*⁴.

Regarding claim 6, Fujii teaches the oxidative decomposition of gaseous contaminants such as NO_x, and states that the presence of water in the mixed gas advantageously aids in activating the photocatalyst. *See id.* at par. 34, 36, and 416; clms. 4, 5 and 9.

Response to Arguments

13. Applicant's 7/21/11 arguments vis-à-vis rejections based in whole or in part upon Elias et al.'s 2000 article have been fully considered and are persuasive. Said rejections have been withdrawn. However, upon further consideration, the new grounds of rejection above are made in view of newly-found prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL BERNIS whose telephone number is (571)270-5839. The examiner can normally be reached on Monday thru Thursday, 9AM-6PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached at (571)272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. B./ December 13, 2011
Examiner, Art Unit 1736

/Stanley Silverman/
Supervisory Patent Examiner, Art Unit
1736

⁴ *See* fn. 1, above.